Validation Metrics - Update
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Metrics Action Items:

- **AI 991021-36** – Establishment of 1st Round Metrics; Impact of Validations on Allowance Effectiveness & Volume of 'G' source codes
- **AI 020827-01** – Establishment of 2nd Round Metrics; Influence of Current Initiatives
- **AI 020827-03** – Impact of Validations on the Volume of Maintenance Transactions
- **AI 030710-03** – Modifications to SSVA Validation Candidate Filters – GCAT & SCWA
- **AI 030416-03** – Feasibility of determining Customer Wait Time as a metric
- **AI 030416-02** – Cost Savings vs Impact to Equipment "Up" time

Validation Metrics

- **Supply (AI's 991021-36 & 020827-01)**
  - **Assumption: Configuration accuracy is a key driving factor in maintaining correct parts listings and allowances in SNAP.**
  - **Metrics:**
    - **Allowance Effectiveness -** measures the % of parts that were issued for maintenance that had an allowance in the ship's SRF in SNAP. Indicates how well the allowance product is supporting maintenance actions
    - **Volume of 'G' Source Codes -** 'Not Carried' repair part issued for maintenance which is not listed on an APL in the ship's COS file in SNAP. Causes for a 'G' source coded issues are configuration inaccuracies and/or provisioning problems
- **Maintenance (AI 020827-03)**
  - **Assumption: Ships' force ability to perform maintenance (right parts, tech manuals, training and facilities) is improved by configuration corrections found through validations.**
  - **Metrics:**
    - **Number of Maintenance Actions -** How much maintenance did validations impact?
    - **% of Total Maintenance Actions -** How much of the ship's total maintenance was impacted by validations?
- **Validation ROI (AI 020827-03)**
  - **Assumption: By selectively targeting validations and correcting configuration problems, readiness and the ship's ability to perform maintenance will improve.**
  - **Metric:**
    - **% of Validated RICs -** How much maintenance was performed on the RICs we validated?

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Metrics Status – Ships Selected

Round 1 – Completed

Avail Dates: 1998-1999

- **Initial measurement**

- **Workfiles received; 24 month analysis complete**
  - USS Normandy (CG 60)
  - USS Anzio (CG 68)
  - USS Port Royal (CG 73)
  - USS Hewitt (DD 966)
  - USS Caron (DD 970) – 18 mo analysis/decom Oct 01
  - USS Laboon (DDG 58)
  - USS Russell (DDG 59)
  - USS Milius (DDG 69)
  - USS Boone (FFG 28)
  - USS Austin (LPD 4)
  - USS Duluth (LPD 6)
- **Workfiles requested:**
  - USS Tarawa (LHA 1) – NNSY – funding?
  - USS Saipan (LHA 2) – NNSY – funding?
  - USS Ashland (LSD 48) - Boston - workfile parameters
        forwarded 7/01
- **Workfiles not available:**
  - USS Dallas (SSN 700)

Round 2 – Completed

Avail Dates: 2001-2002

- **Improvement due to initiatives?**
  - RMMCO
  - Standardized SSVA procedures
  - CILS-TAT vs non-CILS-TAT ships
  - NEMAIS Phase A

- **Workfiles received; 24 month analysis complete**
  - USS Bunker Hill (CG 52)
  - USS San Jacinto (CG 56)
  - USS Shiloh (CG 67)
  - USS Donald Cook (DDG 75)
  - USS Saipan (LHA 2)

- **Workfiles requested:**
  - USS Duluth (LPD 6) – NSLC Jax – no response

Metrics Status – Summary

Supply Metric:	Fleet Average	Rnd 1 Ships	Eff Improvement	Results:	
Allowance Effectiveness	74.0%	64.8%	1.9%		
		Rnd 2 Ships	Eff Improvement	⬆	
		72.6%	2.5%		

• Validations are contributing to Allowance Effectiveness improvement.

Supply Metric:	Fleet Average	Rnd 1 Ships	# 'G' Avoided	Results:	
G' Source Code Avoidance	280	212	102		
		Rnd 2 Ships	# 'G' Avoided	⬆	
		297	168		

• Validations are contributing to the reduction of G source codes, allowing to ships to better identify parts associated with the installed equipment.

Maintenance Metric:		Rnd 1 Ships	MA Impacted	Results:	
# Maintenance Actions Impacted by Validation		4761	248 (6%)		
		Rnd 2 Ships	MA Impacted	⬇	
		6770	86 (1.3%)		

• Despite the increase in maintenance actions, the ships are not performing maintenance on the things we are validating!

Validation ROI:		Rnd 1 Ships	Follow-on Maintenance	Results:	
Validated APLs with Follow-on Maintenance		301	51 (17%)		
		Rnd 2 Ships	Follow-on Maintenance	⬇	
		549	28 (5.2%)		

• Despite the increase in validations, we are validating equipment that is not having maintenance performed on it!

How are we doing?
What can we do better?

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Validations – Modifications to GCAT/SCWA filters
(AI 030710-03)

- **Changes to the candidate selection process (approved at CDM/ISEA Conference – July 2003)**
  - **Changes made GCAT:**
    - Remove Critical ESWBS filter. Implemented 9/10/03. Result: Increase in GCAT validation candidates by 26%.
  - **Changes made to SCWA:**
    - Include temporary Pseudo-RICs (X-RICs). Already a part of the process.
    - Remove Critical ESWBS filter. Implemented 9/10/03. Result: Increased the number of the validation candidates by 40%.
    - Increase Val Date parameter from 2 years to 4 years. Implemented 12/2/03. Result: Decreased the number of validation candidates by 10%.
    - Include RNV=1 as candidates. Implemented 12/2/03. Result: Increased the number of validation candidates by 3%, though most ships have not shown any increase.
    - Include all valves. Implemented 2/19/04. Result: Increased the number of validation candidates by 27%.
  - **Results:** A significant increase in validation candidates!
- **Proposed changes made to SCWA – Addition of Type 4 (Alteration) records**
  - **RT4 structure:**
    - does not have the data fields necessary to post "validation" data - VSAC, RNV, DOVC, Val Worthy and Val Date.
    - RT4 structure can only provide limited data elements for SCWA comparison and for the resulting validation aids.
      - UIC, Ship Hull, Alt RIC, RIC Nomen, AINAC, LSSC, Alt Rin, Alt Status, Rptg Date, Alt ID, Parent RIN
      - One work around would be to pull the remaining data elements from the parent RT2 record based on Parent RIN - RIN, EFD, EIN, Location, Serial Number, NHA, EIC, ESD, SAC, SAC Nomen, HSC, ESWBS, WCRE, Eqpt Disc, SCAT, MCC, PRID. Possible use of VSAC, RNV, Val Date, Val Worthy
  - **Current process:**
    - filters out APLs that don't have an LSSC *A, AP, AQ - keeping only APLs with parts/potential parts support.
    - Some alteration APLs have LSSC of AA, but there are alot that don't have parts support and have LSSC of AC, FG, MD, etc.
    - Current process filters out any APL with AINAC *S - alteration APLs
  - **Anticipated Results:** Another significant increase in validation candidates!

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Validation Metrics – Customer Wait Time Avoidance
(AI 030416-03)

- **Operational Readiness (Ao)**

  - Ao = Run time / (Run time + Repair Time + Logistics Delay Time (AKA CWT))

- **What impact do validation efforts have on potentially reducing CWT?**

- **Original results from Test Ship: USS Normandy (CG 60) – Jul '03**

  - 6350 closed maintenance actions – 9/1/00 – 2/28/02; 1,987 required parts
  - Original Avg CWT: 45.5 days per maintenance action
  - Number of A/C Source Coded issues impacted by validation: 131 issues
  - Recalculated Avg CWT: 46.2 days per maintenance action
  - **Avg CWT Avoidance: 0.7 days per maintenance action (not a whole lot!)**

- **Suspect 45.5 days Avg CWT for parts per maintenance action is too long. Investigate.**

Validation Metrics – CWT Avoidance Development (cont)

- **Historic Benchmarks: prior studies have shown CWT for a individual NIIN is between 25 and 36 days**
  - Defense Inventory draft GAO-03-887: Navy Spare Parts Average Wait Time, in Days, FY 99 & FY 00 = 25.6 days
  - CWT Brief by Terry Trepal at Acquisition and Logistics Excellence Week, Sept 2001: Navy Maritime Mean CWT for repair parts = 36.1 days

- **Verification of CG 60's data**
  - For CG 60, average CWT for each issued NIIN = 35.9 days. We're in the right ballpark!
  - Remember, we are looking at the collective CWT per <u>Maintenance Action</u>. . . Multiple NIIN requirements may overlap or gap, creating a longer CWT per maintenance action.

- **Researching CWT "outliers"**
  - 1,987 maintenance actions had time awaiting parts
  - 80% of the JCNs received all their repair parts within 63 days
    - 90% of the JCNs received all their repair parts within 118 days;
      - 95% of the JCNs received all their repair parts within 195 days.
    - 99 maintenance actions had time awaiting parts > 195 days.
    - The longest wait time was 1562 days.

- **Recalculating CWT excluding "outliers"**

Percentile	# Maint Actions	Orig CWT	Recalc CWT	CWT Avoidance
80th	1597	17.1 days	17.9 days	0.8 days
90th	1790	24.6 days	25.4 days	0.8 days
95th	1888	21.1 days	31.8 days	0.7 days
All	1987	45.5 days	46.2 days	0.7 days

- **Conclusion: Including/excluding "outliers" has no impact on calculation of Avg CWT Avoidance.**

Validation Metrics - Cost
(AI 030416-02)

- **How do we measure cost avoidance?**

- **Previous cost analysis**: SSVA Validation Results – Cost of subsequent TOB allowance requirements (FLSIC AI # 990520-05 presented Oct '99)
  - 17,859 Config Adds on 50 UICs (Avg – 357 Adds Per Ship)
  - Allowance shortages for config adds: Avg - 28 Req'ns totalling $8K per ship
  - Subsequent parts usage for allowance shortages: Avg – 3 supply issues per ship; Impact to Allowance Effectiveness was 0.2% increase

- **Suggestion:** Ratio of cost (man hours to validate) to readiness improvement (Ao, CWT)
  - Measurable – Cost (man hours to validate) – from FTSC?
  - Measurable – Maintenance & Parts related - calculate CWT avoidance
  - How do we quantify the impact of non-parts related readiness factors (reduced repair time due to correct training, tech manuals, facilities, etc.)?

- **Results:**
  - Selected ship (LHA 2) did not have SSVA validation performed by FTSCLant. No cost available.